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SPECIFICATION FOR QUALITY GRADES OF UNDYED MEDULLATED WOOL

UDC 677·31·027·81 : 677·017·272

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

December 1984

Indian Standard

SPECIFICATION FOR QUALITY GRADES OF UNDYED MEDULLATED WOOL

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Indian Standard

SPECIFICATION FOR QUALITY GRADES OF UNDYED MEDULLATED WOOL

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 10 February 1984, after the draft finalized by the Wool and Wool Products Sectional Committee had been approved by the Textile Division Council.

0.2 ' Indian Standard fineness grades of wool ' (IS : 5910*) was published in 1970 and was subsequently revised in 1977 along with IS : 5911†. Inspite of these revisions, it has been felt that the very nature of the medullated wools, that is, hetrogenous fleeces, necessitates application of an altogether different criterion for evaluation of fineness grades of Indian wools and that Indian Standard based on ASTM Designation D-419-1976 ' Specification for fineness of wool and assignment of grade ' and D-472-1969 ' Specification for fineness of wool top and assignment of grade ' cannot be applied to these hetrogenous wools.

0.3 Thus it has been observed that medullated wools should be assessed for their fineness grades on the basis of their hairiness and distribution of fibres of different thickness rather than an average micron value and standard deviation of fibre fineness.

0.4 The fineness grades of imported wool and wool tops exhibit, according to IS : 5910-1977* and IS : 5911-1977†, a difference of 0·4 to 1·0 micron, the tops being coarser due to the removal of finer noils during combing. However, the very high degree of hetrogenity observed in case of all medullated wools, that is Indian wools, necessitated a separate standard for medullated wool.

0.5 This standard after a very careful study of the various medullated wools suggests five distinct grades for medullated wools on the basis of the following characteristics:

a) Hairiness, and
b) Distribution of coarse fibres.

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*Fineness grades of wool tops (*first revision*).

†Fineness grades of wool (*first revision*).

NOTE — Grade I will be the least hairy and Grade V will be the most hairy wool. Grade A will indicate wools with very few coarse fibres and Grade E will indicate wools with a very high percentage of coarse fibres.

0.6 IS : 5910-1977* and IS : 5911-1977† shall be applicable only for assigning fineness grades to wools other than medullated and shall no longer be applicable to undyed medullated wools.

0.7 The term ' Grade ' as used in this standard should not be mixed with the terms ' Quality ' and ' Type '. ' Quality ' is a term that includes not only fineness but also characteristics such as length, crimp, strength, elasticity, lustre and colour, all of which affect the spinnability of wool and the properties of the yarn and fabric produced from wool. ' Type ' is a term designating a particular combination of characteristics appropriately to a specific use or descriptive of geographical origin, breed of sheep or preparation for market.

0.8 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960‡. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard specifies the quality grades of undyed medullated wools on the basis of their hairiness and the distribution of coarse fibres.

2. TERMINOLOGY

2.1 Grade — For the purpose of this standard, the term ' Grade ' shall be a descriptive term used to classify medullated wools and wool tops or any other product made therefrom on the basis of their ' fineness ', as reflected in their ' hairiness ' and distribution of coarse fibres.

2.2 Hairiness — Hairiness is a term used to define the percentage of fibres showing continuous medulla (*see* Fig. 1) in a given sample. This includes ' kemp '.

2.3 ' Medullated ' Fibre — It is a wool fibre, the central portion of which is hollow-occupied by medulla cells and air - and appears black in cedarwood oil or paraffin oil media when viewed on a projection microscope screen due to reflection of light by the air.

2.4 True Wool Fibres — True wool fibres are those which are non-medullated.

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*Fineness grades of wool tops (*first revision*).

†Fineness grades of wool (*first revision*).

‡Rules for rounding off numerical values (*revised*).

2.5 Heterotype Fibres — Heterotype fibres are those which show discontinuous medullation as illustrated in Fig. 1.

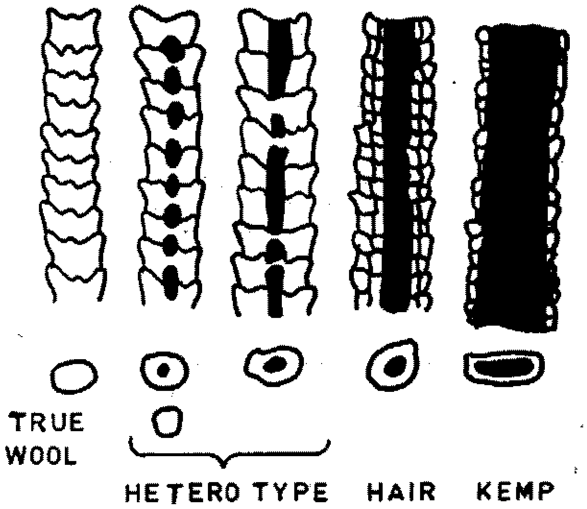

FIG. 1 CLASSIFICATION OF WOOL FIBRES ACCORDING TO MEDULLATION

3. GRADES

3.1 The specifications for various grades of undyed medullated wools are defined in Table 1.

TABLE 1 FINENESS GRADES OF UNDYED MEDULLATED WOOLS ON THE BASIS OF HAIRINESS AND FIBRE DISTRIBUTION

(*Clauses* 3.1 *and* 7.1)

HAIRINESS GRADE	MAXIMUM HAIRINESS PERMISSIBLE (PERCENT HAIRY FIBRES)	FINENESS GRADE	FIBRE DISTRIBUTION PERMISSIBLE LIMITS: PERCENTAGE FIBRES BY COUNT		
			Below 40 µm *Min*	Below 60 µm *Min*	Above 80 µm *Max*
I	20·0	A	70·0	—	1·0
II	35·0	B	60·0	—	3·0
III	45·0	C	—	90·0	5·0
IV	60·0	D	—	85·0	10·0
V	70·0	E	—	80·0	15·0

4. METHOD OF TEST

4.1 Sampling and Preparation of Specimens — Draw a representative sample of wool, sliver or products made therefrom. Prepare test specimen as described in **7.2** of IS : 744-1977*.

4.2 Condition the test specimen as described in **4.1** of IS : 744-1977*.

5. PREPARATION OF SLIDES

5.1 Prepare slides by following the procedure as given in **8** of IS : 744-1977* and cover them with cover slips. Commence measurement after 30 minutes. Avoid the use of excessive mounting medium as it has a tendency to penetrate the medulla and impart the appearance of a true wool fibre to hairy fibres in course of time.

6. PROCEDURE

6.1 Examine the slides with the aid of a suitable projection microscope as defined in **5.1** and **9.1** of IS : 744-1977* at a magnification of 250 instead of 500.

6.2 Identify fibres projected on the entire screen and group them into two categories, namely: (a) hairy fibres, and (b) true plus heterotype fibres as illustrated in Fig. 1 and as defined in **2** above. Enter the data as illustrated in Table 2.

6.3 Count the fibres projected on the inner circle. Then measure and record the number of fibres above the stipulated limit of coarseness as illustrated in Table 2 by following the measurement technique as given in **9.1**, **9.2** and **9.3** of IS : 744-1977*.

6.4 At least 5 000 fibres should be examined for determining the percentage of hairy fibres according to **6.2** above (that is over 500 fibres per slide) and 2 000 fibres should be examined according to **6.3** above for finding out the distribution of coarse fibres. In actual practice, this takes a lesser time than measuring the actual fibre fineness of 1 000 fibres according to IS : 744-1977*.

6.5 Calculate the grade according to hairiness and also according to the distribution of coarser fibres.

6.6 Care should be taken to ensure that the representative sample is cut once only; and under no circumstances the multiple cuts of the same sample should be included. In other words, the same fiibre should not be measured twice.

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*Method for determination of wool fibre diameter — Projection microscope method (*second revision*).

TABLE 2 EXAMPLE OF THE RECORD OF HAIRINESS AND DISTRIBUTION OF COARSE FIBRES

(*Clauses* 6.2 *and* 6.3)

Sl No.	Fibre Appearance in Full Screen			Number of Fibres on the Inner Circle			
	No. of True Wool + Heterotype Fibres	No. of Hairy Fibres	Total No. of Fibres Viewed	Below 40 µm	40 to 60 µm (excluding 60 µm)	Above 80 µm	Total No. of Fibres Viewed
1.	15	2	17	2	0	0	3
2.	22	7	29	3	1	1	6
3.	10	1	11	3	1	0	5
4.	7	3	10	2	0	0	3
5.	18	4	22	4	2	0	7
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n	32	7	39	8	3	0	13
Total	4 160	860	5 020	1 461	436	52	2 180
Percentage	82·9	17·1	100	67·0	20	2·4	100
Grade Assigned		I			B		

7. ASSIGNMENT OF GRADE

7.1 Compare percentage of hairy fibres and assign grades I to V as specified in Table 1.

7.2 Compare fibre distribution and assign grades A to E, whichever is higher according to fibres below 40 µm or 60 µm or above 80 µm. Fibres above 80 µm are usually kemps.

7.2.1 A few typical examples illustrating the assignment of grades are given below:

Example 1

Percentage of hairy fibres	16·8
Percentage of fibres below 40 µm	73·0
Percentage of fibres above 80 µm	0·3
GRADE ASSIGNED	I-A

Example 2

Percentage of hairy fibres	33·5
Percentage of fibres below 40 µm	68·0
Percentage of fibres above 80 µm	4·7
GRADE ASSIGNED	II-C

Example 3

Percentage of hairy fibres	49·7
Percentage of fibres below 60 µm	91·3
Percentage of fibres above 80 µm	2·5
GRADE ASSIGNED	IV-C

Example 4

Percentage of hairy fibres	3·8 (*see* note)
Percentage of fibres below 40 µm	69·0
Percentage of fibres above 80 µm	0·1
GRADE ASSIGNED	I-B

NOTE — Since the hairiness is low, that is, below 5 percent, this wool may be further assessed according to IS : 5910-1977* or IS : 5911-1977† depending upon whether wool or wool top; for assigning specific fineness grades for example 56s, 48s, 36s, etc.

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*Fineness grades of wool (*first revision*).

†Fineness grades of wool tops (*first revision*).